

PRE-ALGEBRA

These questions will test your knowledge of operations using whole numbers, fractions, and decimals; square roots; scientific notation; linear inequalities with one variable; ratio, proportion, and percent; absolute value; simple probability; data interpretation; and very basic statistics. Pre-Algebra questions make up approximately 23 percent of the ACT Mathematics Test.

Difficulty Level: Easy

1. The odometer on Jordan's car read 23,273 miles when he left on a trip and 23,650 miles when he returned. Jordan drove his car 6.5 hours on the trip. Based on the odometer readings, what was his average driving speed on the trip, in miles per hour?
 - A. 53
 - B. 58
 - C. 60
 - D. 65
 - E. 67
2. For integers x and y such that $xy = 8$, which of the following is NOT a possible value of x ?
 - F. -8
 - G. -6
 - H. -4
 - J. 1
 - K. 2
3. For the campers attending College Prep Camp this summer, the ratio of male campers to female campers is 3:5. Which of the following statements about the campers is(are) true?
 - I. For every 5 females, there are 3 males.
 - II. There are more males than females.
 - III. Males comprise $\frac{3}{5}$ of the campers.
 - A. I only
 - B. II only
 - C. III only
 - D. II and III only
 - E. I, II, and III
4. Al needs $12\frac{1}{4}$ feet of lumber to complete a project. He has $8\frac{1}{2}$ feet of lumber. How many more feet of lumber does he need?
 - F. $3\frac{1}{2}$ feet
 - G. $3\frac{1}{3}$ feet
 - H. $3\frac{3}{4}$ feet
 - J. 4 feet
 - K. $4\frac{1}{3}$ feet

5. What is the solution to the equation $5b - (-b + 3) = 21$?
- A. -4
 - B. 4
 - C. 6
 - D. 7
 - E. 13

6. What is the median of the data given below?

8, 13, 9, 8, 15, 14, 10

- F. 8
- G. 8.5
- H. 10
- J. 11
- K. 15

7. What is the value of $|4 - x|$ if $x = 7$?

- A. -3
- B. 3
- C. 4
- D. 11
- E. 28

8. Mike has 2 more baseball cards than Jen. Then he bought 3 baseball cards from Jen. Now how many more baseball cards does Mike have than Jen?

- F. 12
- G. 8
- H. 6
- J. 2
- K. -4

Difficulty Level: Medium

9. The cost for a company to produce c computers in 1 year is $\$200c + \$300,000$. How many computers can the company produce in 1 year at a cost of $\$700,000$?

- A. 2,000
- B. 2,667
- C. 3,500
- D. 5,000
- E. 5,333

10. $\left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^2 + \left(\frac{1}{4}\right)^2 = ?$

- F. $\frac{1}{29}$
- G. $\frac{3}{29}$
- H. $\frac{61}{144}$
- J. $\frac{15}{32}$
- K. 9

11. If you add up 6 consecutive even integers that are each greater than 25, what is the smallest possible sum?
- A. 150
B. 165
C. 174
D. 186
E. 210
12. About what percent of $\frac{3}{5}$ is $\frac{1}{5}$?
- F. 20%
G. 33%
H. 50%
J. 67%
K. 300%
13. According to a recent survey of children about their favorite color, 20% of the children preferred red, 40% of the children preferred blue, 20% of the children preferred purple, and the remaining children preferred green. If each child preferred only 1 color and 30 children preferred green, how many children were surveyed?
- A. 60
B. 90
C. 120
D. 150
E. 180
14. The ratio of the side of square X to the length of rectangle Y is 4:5. The ratio of a side of square X to the width of rectangle Y is 4:3. What is the ratio of the area of square X to the area of rectangle Y ?
- F. 12:15
G. 16:15
H. 18:15
J. 10:16
K. 12:16

Difficulty Level: Hard

15. For all nonzero a and b , $\frac{(a \times 0.01)(b \times 10^3)}{(a \times 10^{-2})(b \times 1,000)} = ?$
- A. 1
B. 10
C. 10^5
D. $\frac{a}{b}$
E. $\frac{b^2}{a}$
16. Let $a \diamond b = (a - b)^3$ for all integers a and b . Which of the following is the value of $3 \diamond (-2)$?
- F. 1
G. 19
H. 35
J. 125
K. 216
17. For any real number n , the equation $|x - n| = 8$ can be thought of as meaning "the distance on the real number line from x to n is 8 units." How far apart are the 2 solutions for n ?
- A. n
B. $2n$
C. $8 + n$
D. $\sqrt{8^2 + n^2}$
E. 16
18. What is the 211th digit after the decimal point in the repeating decimal $0.\overline{84392}$?
- F. 9
G. 8
H. 4
J. 2
K. 0